Annals of R.S.C.B., ISSN: 1583-6258, Vol. 25, Issue 6, 2021, Pages. 1066-1075
Received 25 April 2021; Accepted 08 May 2021.

Implant supported overdenture: A Case Report

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Abstract:
The prosthetic management of the edentulous patient has long been a major challenge. Complete maxillary and mandibular dentures have been the traditional standard of care. However, most of the patients report problems adapting to their mandibular denture due to a lack of comfort, retention, stability and inability to masticate. Implant supported overdentures have proved to be one of the best alternative Options in prosthetic rehabilitation of various cases of edentulism. They satisfy the Patient's expectations, improve quality of life with their long term serviceability and predictable outcomes. Over the years, significant advancements have taken place in the implant systems and the methods of attachments. This paper describes A case report in which a completely edentulous patient was rehabilitated with An implant supported overdenture in mandible and maxilla.

Keywords: Dental implant, edentulous mandible, overdentures, rehabilitation

CASE REPORT:

A 41-year-old male patient reported for the prosthodontic rehabilitation of his edentulous jaws. The chief complaint of the patient was ill fitting mandibular denture. Past medical history was no major illness. His dental history included extraction of the periodontally involved teeth and their replacement with maxillary and mandibular immediate dentures. Clinical examination included an evaluation of size and shape of the edentulous ridge, palpation for undercut and an assessment of condition of the mucosa. Clinical examination revealed completely healed maxillary and mandibular edentulous ridges[Fig-1].Mandibular ridge exhibited a moderate degree of alveolar

ridge resorption in posterior region. Overlying mucosa was healthy and normal. Temporomandibular joint examination was found to be normal. Evaluation of the existing dentures revealed inadequate denture extensions, poor retention and stability.Orthopantomograph was advised to evaluate bone availability and architecture[Fig-2].The inter-ridge distance was assessed. Routine blood examination revealed no abnormal findings. A treatment plan was prepared after a standard protocol. It included fabrication of a implant supported overdenture for the maxillary arch and a 2-free standing implant-supported overdenture for the mandibular arch. This decision was taken considering the resorption of the posterior region. This treatment plan was explained to the patient and was approved by him.

Treatment procedure: Maxillary and mandibular dentures were fabricated in conventional manner. Bilateral balanced occlusal scheme was selected. Deflecting contacts in both centric and dynamic parafunction were eliminated. Patient was instructed regarding the maintenance at the time of denture insertion. The mandibular denture was duplicated in a 2-part top and bottom poly vinyl siloxane (Reprosil TMDentsply) using clear auto-polymerized acrylic resign(DPI self cured Acrylic resin, Clear). This was used as a surgical template. The desired implant location was marked on the duplicate denture and stone cast. Corresponding implant position and angulations were marked on the surgical template with an indelible ink pencil [Fig-3]. Vertical space analysis of the denture was performed. Adin (Touareg TM) implants of 11.5 mm length and 3.75 mm diameter was selected. It was decided to use ball and socket type of attachment system. Implant surgery included alveolar ridge reduction and placement of the implants with the help of a surgical template (duplicate mandibular denture). Implant surgery was carried out in a 2- stage surgical protocol. Surgery was performed under local anesthesia. The osteotomy sites were prepared with the help of surgical template. A guide pin was used to ensure that the second implant was as parallel as possible to the first. The selected implants were placed at the prepared sites. Surgical cover screws were placed. The flaps were approximated with primary closure [Fig-4 & 5]. The patient was told not to wear the denture for two weeks following surgery. Antibiotics were prescribed for seven days. Patient was advised to use disinfectant mouth rinse (Listerine) 3-5 times daily. Instructions were given regarding oral hygiene maintenance. The sutures were removed in two weeks. Dietary restrictions were lifted after 2 weeks of implant placement. The intaglio surface of the denture was relieved. Soft tissue conditioning material (GC Reline Soft TM) was applied to the intaglio surface of the denture according to the manufacturer's directions and the excess liner material was trimmed. The denture was finished, polished and inserted into the patient's mouth. This allowed the patient to wear the removable prosthesis during the period of osseointegration without transmitting excessive forces to the surgical sites. The patient was seen on a regular follow-up visits and the denture was relined as needed. Three months later and after confirmation of the osseointegration, the patient was presented for the second stage surgery. At this stage, the implants were exposed, the surgical cover screws were removed and the sites were irrigated with sterile normal saline (Normal saline Flush). Healing collars were placed, and the gingival tissues were allowed to mature for one month. Mandibular denture was relined with a soft-tissue conditioning material (GC Reline Soft TM). After one month, the comfort and fit of the dentures was checked before proceeding with the addition of attachments. Ball and socket over-denture abutment of 2 mm diameter (NP-0022) was selected. Seating of the abutments was verified [Fig-6]. The attachments were placed and O rings (RS-2662, soft yellow) were blocked-out on the abutments. Acrylic resin from the intaglio surface of the denture was removed to allow passive fit of the denture against the tissue. Pressure indicating paste (Mizzy Prestige Dental Products) was used to verify that no contact of the

denture base with abutment or attachment. A No. six round bur was used to vent the pink-up space toward the surface of the denture. The vent was situated lingual to the denture teeth. The pick-up space was half filled with CG Pattern Resin and the mandibular denture was placed over the abutments. The complete seating of the denture was verified and the patient was asked to maintain light occlusal pressure in the centric relation position while the resin polymerizes. The pick-up resin was trimmed and polished in the venting area. Fit and occlusion of the dentures was rechecked in centric relation position. Centric relation records were obtained and a laboratory remount for final occlusal refinement was done [Fig-7,,8]]. Home care instructions were given to the patient. The patient was trained to place and remove the prosthesis properly. First recall was attended after 24 hours. The regular follow up advised every six months. Patient was instructed to remove their prosthesis at night. A soft single-tufted brush was indicated to keep attachments free from plaque and calculus. The patient is successfully using the overdenture since four years and is satisfied with it.

Discussion

The implant-supported overdenture remains in place during mandibular movements which allows the tongue and perioral musculature to resume a more normal function since they are not required to control mandibular denture movements [2-5].

The design of the implant-retained overdenture can be carried out in 2 ways [2,3,6]. In the first approach, implants are splinted with a rigid interconnecting bar that incorporates an attachment mechanism for the overdenture retention. In the other approach, implants are not connected to each other, and the retention mechanism is provided by an abutment that incorporates some form of retentive mechanism. A major advantage of the freestanding implants is the fact that they allow for the use of the prefabricated stock retentive abutments. The use of the interconnecting implant bar requires additional laboratory and clinical procedures for its fabrication and the associated increase in treatment cost. However, in case of the misaligned or malpositioned implants, stock abutments may not provide the desired compensation, and the splinting of the implants with the interconnecting bar can overcome these problems. Another advantage of the prefabricated stock abutments is that the abutment itself can be easily replaced in case of abutment failure. Because stock abutments are identical, their replacement does not require remaking the overdenture. On the other hand, if the implant interconnecting bar has to be remade in the case of failure, it usually required remaking the overdenture. Performance data of the implant-retained overdenture indicate that most of the complications and prosthodontic maintenance are related to the attachment components of the overdenture [3,7-9].Another dilemma associated with overdenture treatment is the technique of incorporating the attachment matrices into the overdenture literature. One approach includes incorporation of the matrices into the overdenture in the dental laboratory. This is an extremely important step and, if

Not performed correctly, can negatively influence overdenture fit or contribute to the dislodgement of the matrix from the overdenture. This method ensures acceptable fit of the overdenture. However, it requires additional clinical time and is technique sensitive. The other approach is pick-up intraorally in the clinic [9-12]. In this case four free standing implants were placed. As the posterior ridge was resorbed, it was thought that it would not offer any support to the denture. Only disadvantage in two implants retained overdenture the rotational movement is of PM6 type which is harmful for the implant as well as to the residual ridge [1]. Therefore,

support was obtained from four free standing implants. Due to financial constraints the patient was not ready for the fixed type of restoration immediately.

As with any treatment modality, aftercare and maintenance is vital if the overdenture is to be successful. The patient must be advised of this and reviewed regularly. Optimal surgical implant positioning is essential for the success of implant supported restorations. An implant-retained overdenture requires meticulous treatment planning than a conventional complete denture. Final placement of the implants should follow the principles of ideal implant parallelism and maximum initial stabilization, and path of placement and removal.

Conclusion

Restoration of the edentulous mandible is a challenge. Among different treatment options, an implant-retained overdenture is a simple, cost effective solution in the rehabilitation of the edentulous mandible. Despite widespread acceptance of this treatment, some controversies still exist with regard to the design of the overdenture, selection of the appropriate attachment system, and the most optimal techniques for the overdenture fabrication. Clinicians and dental

Technicians have to adhere to sound design principles such as simplicity in fabrication, ease of maintenance and repair and cost control.

Financial or other competing interests

None.

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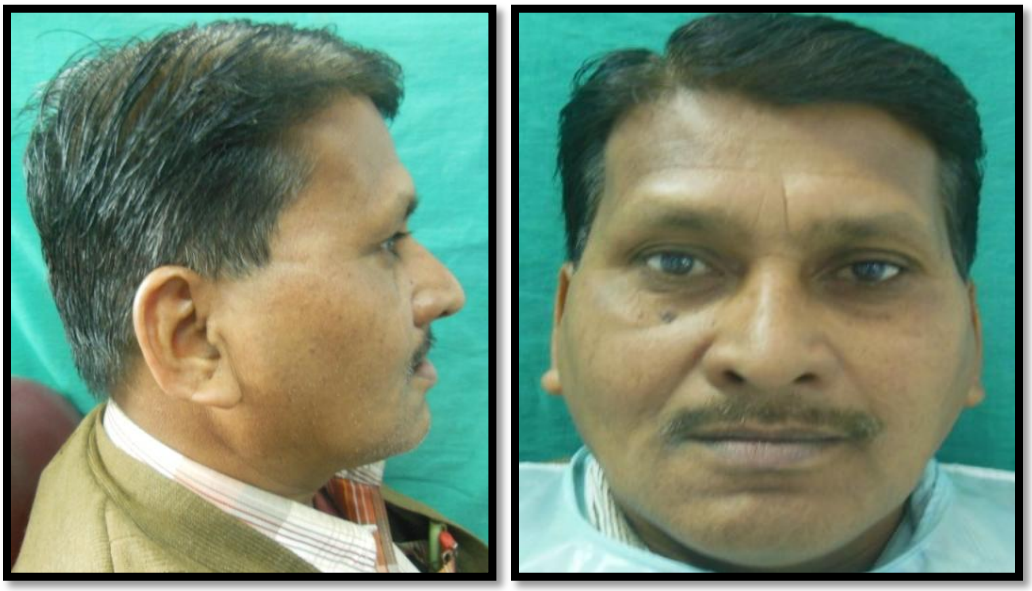

Fig 1a

Annals of R.S.C.B., ISSN: 1583-6258, Vol. 25, Issue 6, 2021, Pages. 1066-1075
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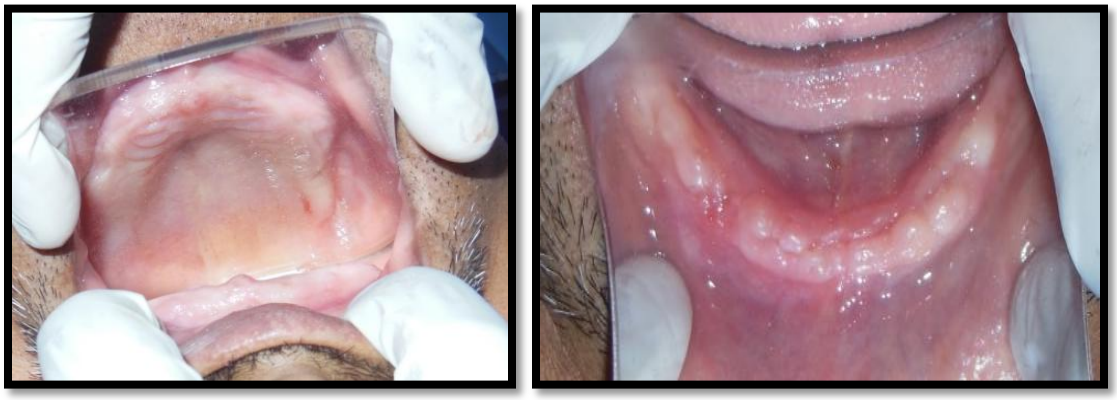
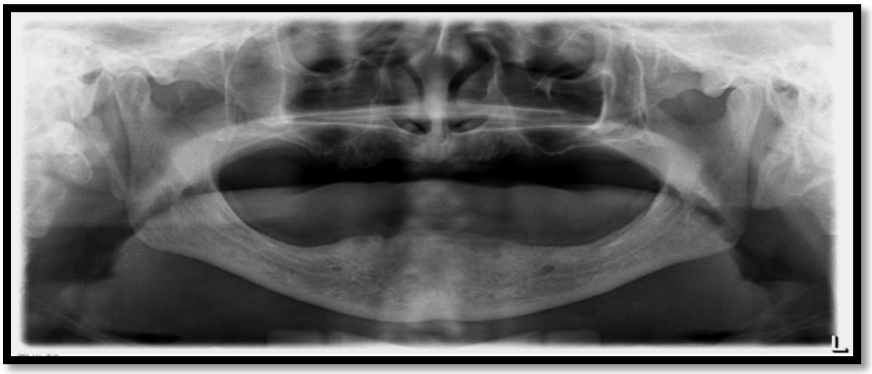
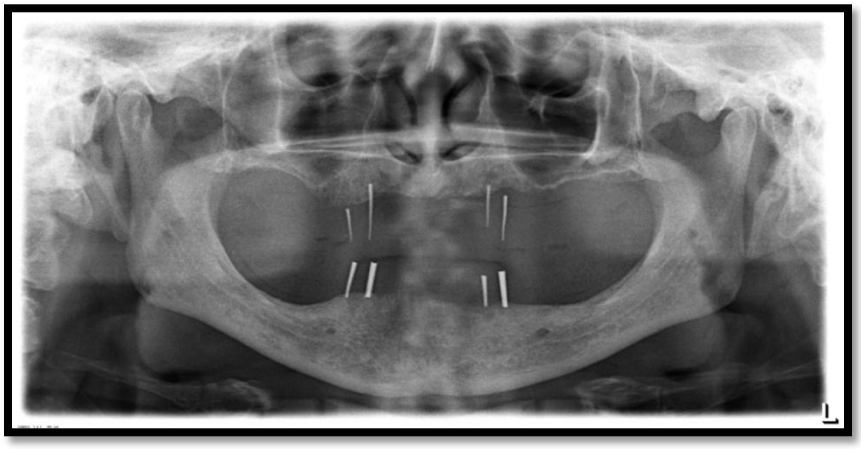


maxillary and mandibular edentulous ridges[Fig-1b]



[Table/Fig-2].OPG



Angulations were marked on the surgical template with an indelible ink pencil [Fig-3a].

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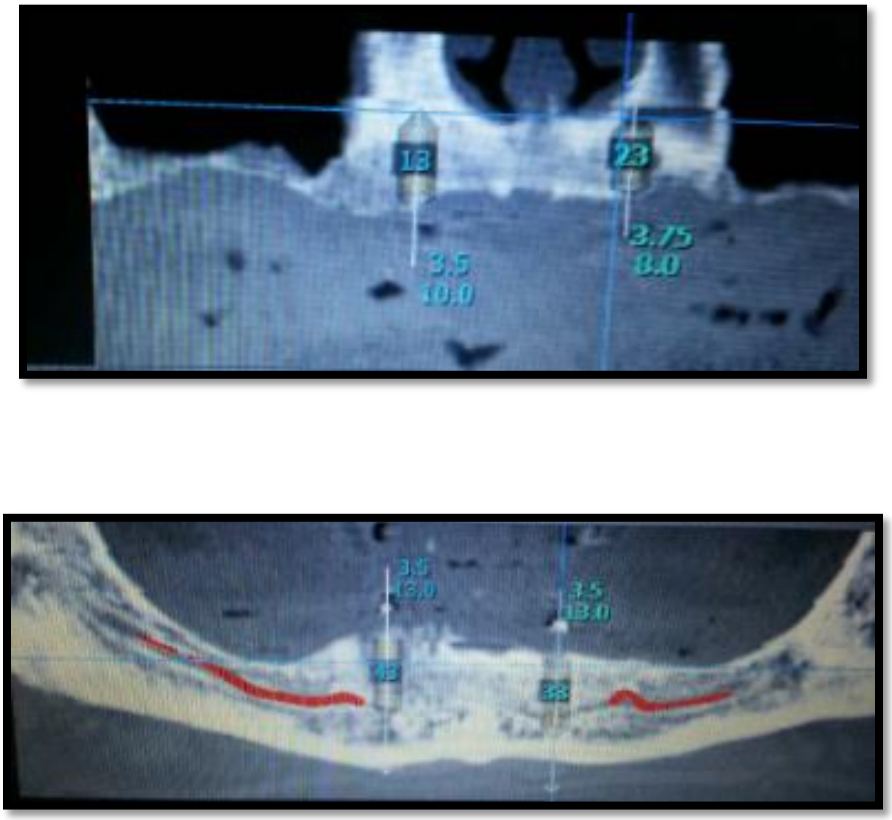
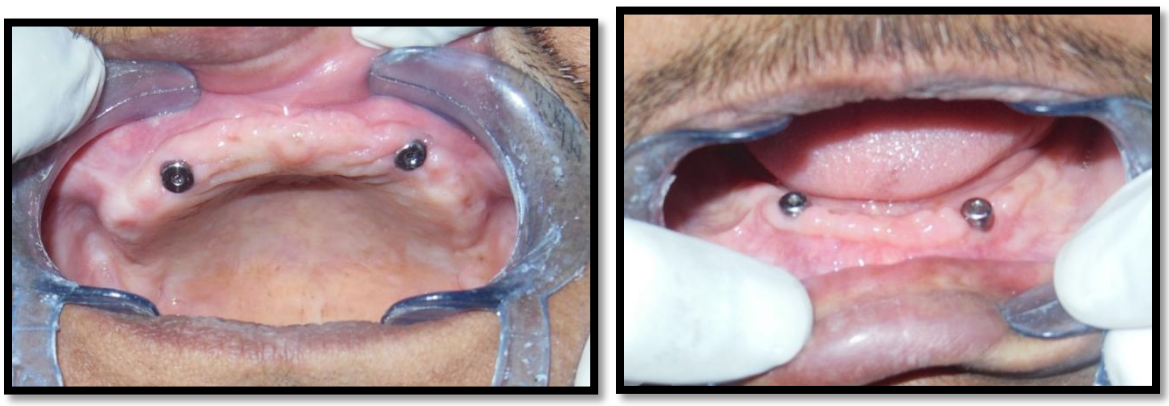


Implant planning in software (Fig-3a].



Implant placement fig 4

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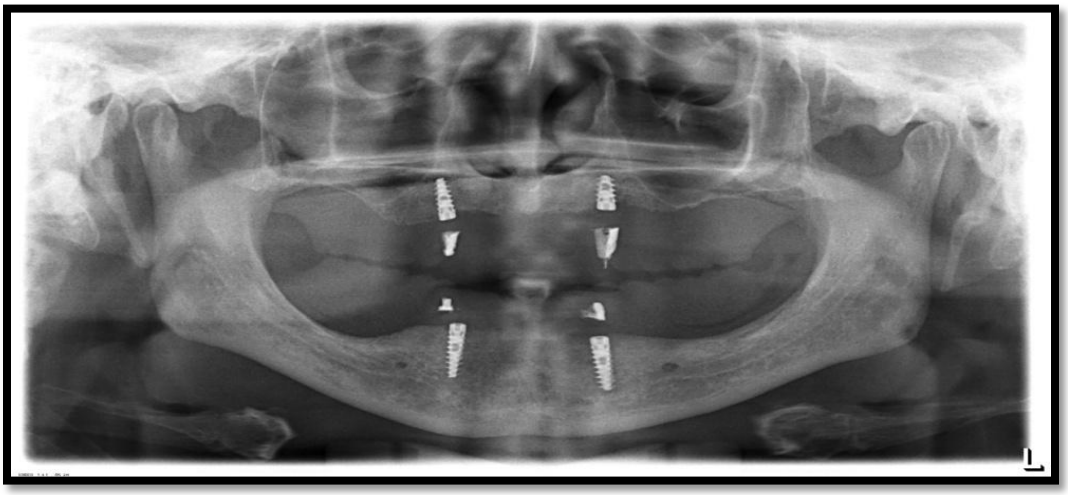
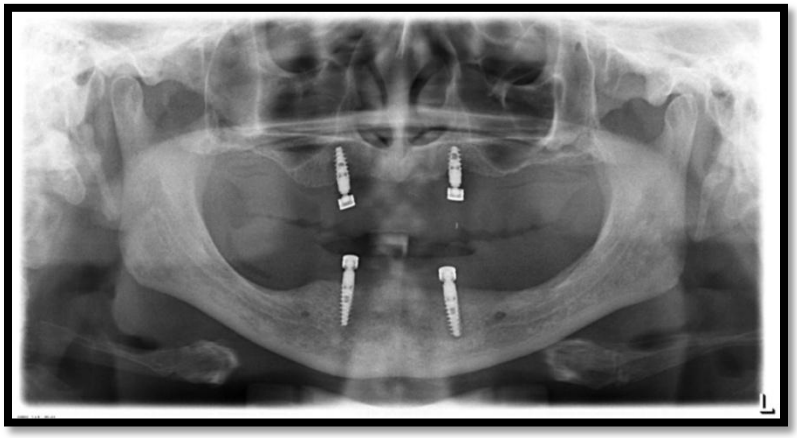


.Seating of the abutments was verified [Fig-6].

O rings (RS-2662, soft yellow)



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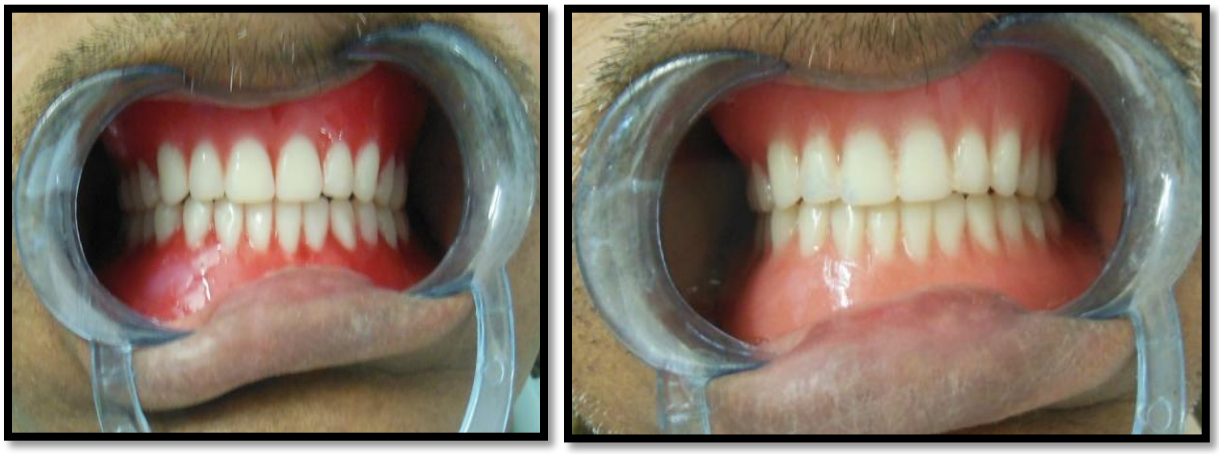
Ball and socket over-denture abutment of 2 mm diameter (NP-0022)



Centric relation records were obtained and a laboratory remount for final occlusal refinement was done [Fig-7,,8]].

BEFORE AFTER

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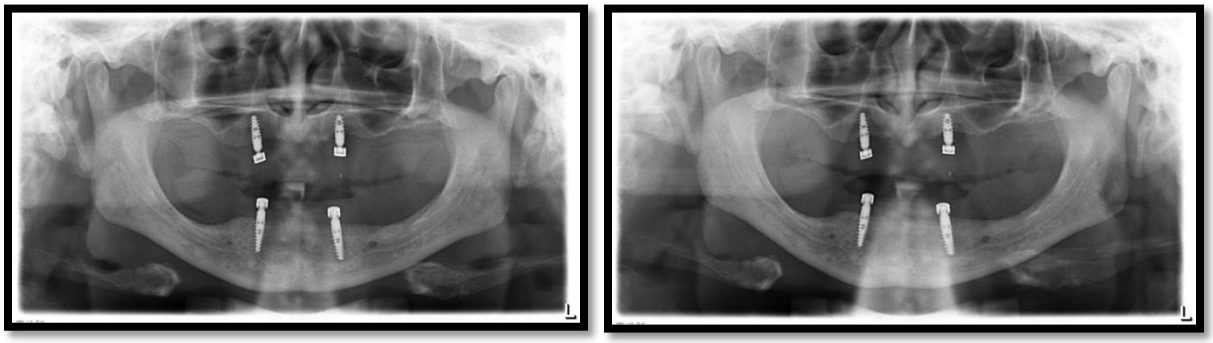

AT THE TIME OF PLACEMENT AFTER 6 MONTH

FIG .9 (6 MONTH REVIEW)